Land Warrior . . .

MANAGING A MILITARY PROGRAM LIKE A COMMERCIAL COMPANY

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Introduction

Prior to reinventing itself, the Land Warrior (LW) Program was a nonsoldier-ready, nonfunctional, and expensive program that was the subject of General Accounting Office (GAO) criticism. The program became a success, however, by using commercial business practices; partnering with industry; using an open architecture with commercial off-the-shelf (COTS) technology and components; and using a product version-based, phased-development approach. This change in business and contract philosophy contributed to the program's success by yielding significant results in cost savings, schedule risk reduction, and technology improvements. Simultaneously, there was an increase in the program's support and visibility within the Department of the Army, DOD, and Congress.

The LW is the first-generation modular, integrated fighting system for infantry soldiers that combines and incorporates sensors; computers; lasers; geographic location; and radios with a soldier's mission equipment. This helps to achieve the Army Chief of Staff's vision of enhancing individual soldier lethality, survivability, mobility, and situational awareness as a holistic integrated system. The systems approach optimizes and integrates these capabilities without adding to the soldier's combat load or logistical footprint.

History

The LW Program originated from a typical cost-plus contract because of technical challenges and risks. The system built under this contract failed many of its May 1998 technical and performance tests, was too heavy and bulky, hindered soldier performance, and was too expensive.

New Business Strategy

In November 1998, the LW Team implemented a new acquisition and business strategy and philosophy to transition the LW system to a COTS and government off-the-shelf (GOTS) open architecture. This was achieved using hardware, software, and interfaces that take advantage of the commercial and consumer marketplace with innovative companies. Understanding that commercial contractors are structured to provide products economically, the LW Team sought to produce a Land Warrior system similar to the way Dell Computer Corp. produces its computer systems for the consumer marketplace.

The LW Team changed the traditional contract relationship in which the prime contractor is typically the administrator, developer, technical integrator, and producer. Many companies, both with and without government experience, were invited to submit two-page performance statements to demonstrate their products and areas of expertise. The team assessed each company based on its demonstrated flexibility and innovation. In addition, the government verified they had a viable path to the future and could tap the competitive commercial marketplace. After companies were selected, a "consortium" was created as a closely integrated team with fixed-price deliverables.

During Alpha-type contract discussions, minimal resources were allocated for overhead costs—with a focus on product development—thus ensuring a thin management layer with two-way visibility between the consortium and the government. One contractor was designated the manager to act as the administrator and banker, and another was designated as the technical lead and inte-

grator. The remaining contractors were to compete and produce components or subsystems (through fixed-price contracts) from commercial marketplace resources.

This new approach, coupled with the contract price structure, eliminated conflicts of interests and encouraged contractors to seek innovative technologies outside their companies for use in the LW system. The approach also allowed each innovative company to focus on its own area of expertise without having to create huge administrative structures.

The LW Team leveraged a product version-based development approach using short duration, fixed-price phases, with known exit criteria for each phase. The intent was to limit cost growth and provide a more accurate picture of progress. Continuous assessments were conducted using this new approach. Changes in the LW system were allowed only at the end of each phase to better anticipate, evaluate, control, and track changes; ensure changes were better matched to actual program challenges; and eliminate cost increases associated with typical cost-plus contracts. This approach produces interim product versions that are built toward the final product with each successive version adding increased functionality, reliability, durability, and producibility. Furthermore, innovative technology can be evaluated off-line for insertion between each phase and version without hindering the success of each phase. The product version model uses short, basic phases.

This process resembles the commercial business model and version-based market, similar to those of Microsoft or Intel. Changes are allowed only at the appropriate time to provide measurable checkpoints and traceable costs. During LW development, a clear definition of each phase end state was established to shorten the time between requirement definition and measurement. This allowed the commercial business model to evolve with shared risk, while controlling the impact of learning, reducing the motivation for changes, and providing an incentive to deliver more products on time and within cost projections.

This phased approach closed the requirements and production gap as well as the risk and cost growth gap, while allowing a mix of COTS (computer and software) and GOTS (Integrated Helmet and Display System/Position Navigation System) solutions. Savings in development time and costs were achieved by staying within target bands during the phased spiral development process while simultaneously reviewing requirements and technologies. This approach also produced a spiral development effort where potential technology changes were assessed and refined at the end of each phase.

Changes and versions yielded a better convergence of technology with user requirements. This effort focused on technology leveraged from first applying technologies from off-the-shelf sources followed by development of technologies for the LW system. Because of an open architecture, this approach reduced any conflict of interest arising from building proprietary components typically associated with cost-plus contracts. This required close involvement between the LW Team and the consortium, with the government staying technically involved. User involvement was expected and encouraged, providing valuable input through user trials and juries directly connected to the development process. Consistent government involvement also allowed more control of intellectual property and rights issues as technology was introduced into the LW system.

How Well We Did

The new LW acquisition philosophy was tested and demonstrated when the team participated in the September 2000 Joint Contingency Force-Advanced Warfighting Experiment (JCF-AWE) at Fort Polk, LA. Although the new philosophy was still in the research and development phase, the LW Team demonstrated that it, along with strong industry partnering, contributed to successful fielding of 55 operational LW systems in less than 9 months. These efforts also led to other significant achievements as follows:

- The team received the 1999 Army Manpower and Personnel Integration Achievement Award for significantly improving the LW's weight, bulk, and soldier interface.
- The Department of the Army nominated the LW Program as a finalist for the DOD David Packard Award for Acquisition Excellence for 2000.
- The Department of the Army's Office of the Deputy Chief of Staff for Logistics selected the LW Integrated Logistics Support (ILS) Team as the winner of the 2000 ILS Achievement Award for ILS management.
- The LW Team received the Army Soldier Biological and Chemical Command Team of the Year Award for 2000.
- The Department of the Army designated the LW as one of seven programs on the Legislative Priority List that is critical to Army transformation success.
- Twelve military-unique and proprietary subsystems and components were transitioned to COTS.
- A commercial computer motherboard could be procured from any of 12 sources for about $440 vice the $32,000 for a military-unique proprietary motherboard.
- Commercial cables could be procured for about $65 as opposed to more than $5,000.
- The weight of the LW system was reduced by 8 pounds and the logistical footprint was reduced by

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consolidating 16 previously carried batteries into a 4-battery integrated system

• The LW was integrated with GOTS open architecture (Army standard load carriage, MOdular Lightweight Load-carrying Equipment).

• The "would cost" unit cost was reduced from more than $102,000 to $30,000.

Where We Are Now

The LW Program evolved from a failing program that was the subject of GAO criticism in November 1998 to a successful program that is now supported by Army leadership. The LW Team now does business using several acquisition reform initiatives in addition to those already discussed. These initiatives include the following:

• Using only performance specifications based on commercial practices.

• Using a test and evaluation integrated product team (IPT) to successfully streamline the testing and safety release process to meet a tight schedule.

• Using interactive Web-based LW IPT sites and an integrated data environment to permit the sharing of program information electronically with all participants.

• Using disciplined cost estimating and modeling to control and reduce program costs.

Lessons Learned

A basic premise of the Dell business model is that when given standards and standard interfaces, systems integration becomes easy with plug-and-play components available from multiple sources. This new philosophy allowed the LW Team to develop the following lessons learned.

• Seek out and use small innovative companies (they don't read the *Commerce Business Daily*) rather than the typical large Defense contractors.

• Eliminate large organizational structures and focus on the product.

• Develop products in terms of versions and use a phased approach to overcome immature and unknown requirements. This will help control changes that typically facilitate cost growth and will aid in the ability to progressively increase and measure functionality, durability, reliability, and producibility.

• Understand that commercial and consumer companies obtain their incentive and rewards by leveraging off-the-shelf technologies first and developing technology second.

• Implement a commercial industry to commercial industry relationship, thus eliminating conflicts of interest and overcoming the cost-plus contract math that encourages changes and keeps products in-house with proprietary solutions.

• Work in totally integrated teams to ensure vertical and horizontal visibility of all partners and efforts.

Conclusion

The commercial and consumer marketplaces tap the natural competitive pressures to bring in new and innovative technology at a lower cost. The government acquisition process must continue to adapt and transition toward a commercial- and consumer-based approach—the rewards are great. We must think, act, and develop cultures to match and link to commercial consumer enterprises.

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